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A new species of *Zygiella* from Amami-ôshima Island, Japan (Araneae: Araneidae)

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Abstract — A new araneid species *Zygiella hiramatsui* n. sp. is described using specimens obtained from Amami-ôshima Island, Japan. This species can be distinguished from allied *Z. dispar* by the much wider median area of the epigyne, or an unnamed apophysis neighboring the embolus that is short and truncated and a horn shaped apophysis of the tegulum in the male palp. It is uncommon for *Zygiella* spiders to inhabit subtropical regions, but this is the case for *Z. hiramatsui* n. sp. So it might be introduced previously into Amami-ôshima Is. from unknown habitat.

Key words — Taxonomy, *Zygiella hiramatsui*, Ryukyu Islands, Nansei Islands, subtropical area

Introduction

To date, two species of the genus *Zygiella*, *Z. dispar* (Kulczyński 1885) and *Z. x-notata* (Clerck 1757), have been recorded in Japan (Tanikawa 2002, 2004). The former species seems to be native to Japan and has been found in various parts of Hokkaido and high elevation areas of Honshu (Shinkai et al. 2016), while the latter species was found only in a car park in Yokohama Port and was likely to have been introduced by human transport (Tanikawa 2004).

A recent faunal survey on Amami-ôshima Island resulted in collection of several specimens of *Zygiella*. This is the first discovery of *Zygiella* from a low elevation or subtropical area in Japan, other than the introduced species *Z. x-notata*. Globally, the 11 known species of the genus *Zygiella* are distributed mainly in the Holarctic region (World Spider Catalogue 2016). Of these, only two species have been found in a tropical or subtropical region: *Z. calyptrate* (Workman & Workman 1894) (China, Burma, Malaysia), and *Z. minima* Schmidt 1968 (Canary Is., Madeira); with the exception of *Z. x-notata* introduced into South America (World Spider Catalogue 2016). However, *Z. calyptrate* is suspected not to belong to *Zygiella* (Levi 1974). Thus, the discovery of the spider in this report from a subtropical area is unusual for *Zygiella* spiders. A close examination revealed that the spider is new to science and is described as a new species in this paper.

Materials and methods

Specimens were preserved in 75% ethanol and their morphological features were observed under a stereoscopic microscope (M3Z, Wild Heerbrugg AG, Heerbrugg, Switzerland). Photographs were taken with a digital camera EOS Kiss X7 with an EF-S 60-mm f2.8 macro photo lens and a MT-24EX macro twin flash (Canon Inc., Tokyo, Japan) or connected to the microscope. All measurements were made with a micrometric ocular lens on the microscope and are given in millimeters. The type specimen designated in this study is deposited in the collection of the Department of Zoology, National Museum of Nature and Science, Tokyo (NSMT).

Taxonomy

Zygiella hiramatsui n. sp.

[Japanese name: Hiramatsu-kire-amigumo]
(Figs. 1A–D, 2A–C)

Type series. Holotype: ♂, 21-X-2015 (collected as a juvenile and became an adult on 15-VI-2016 after raring), En, Tatsugo-cho, Amami-oshima Is., Kagoshima Pref., Japan, A. Tanikawa leg. (NSMT-Ar 14738). Paratypes: All the paratypes were collected at the same locality as for the holotype. 1♂, 24-IX-2015 (collected as a juvenile and became an adult on 22-XII-2015 after raring), T. Hiramatsu leg. (NSMT-Ar 14739). 2♂2♀, 13-XI-2016 (2♂ were collected as juveniles and became adults on 26-XI-2016 and 29-XII-2016 respectively), A. Tanikawa leg. (NSMT-Ar 14740–14743).

Specimens examined for comparison. *Zygiella dispar*: All the specimens were collected from Hokkaido, Japan by M. Matsuda. 2♀, 1-VIII-1995, Ukishima-shitsugen, Kamikawa-cho; 1♂, 19-VII-1981, Mt. Nipesotsu, Kamishihoro-cho; 1♂, 28-VII-1994, 3♀, 10-VII-2000, 1♀, 1-X-

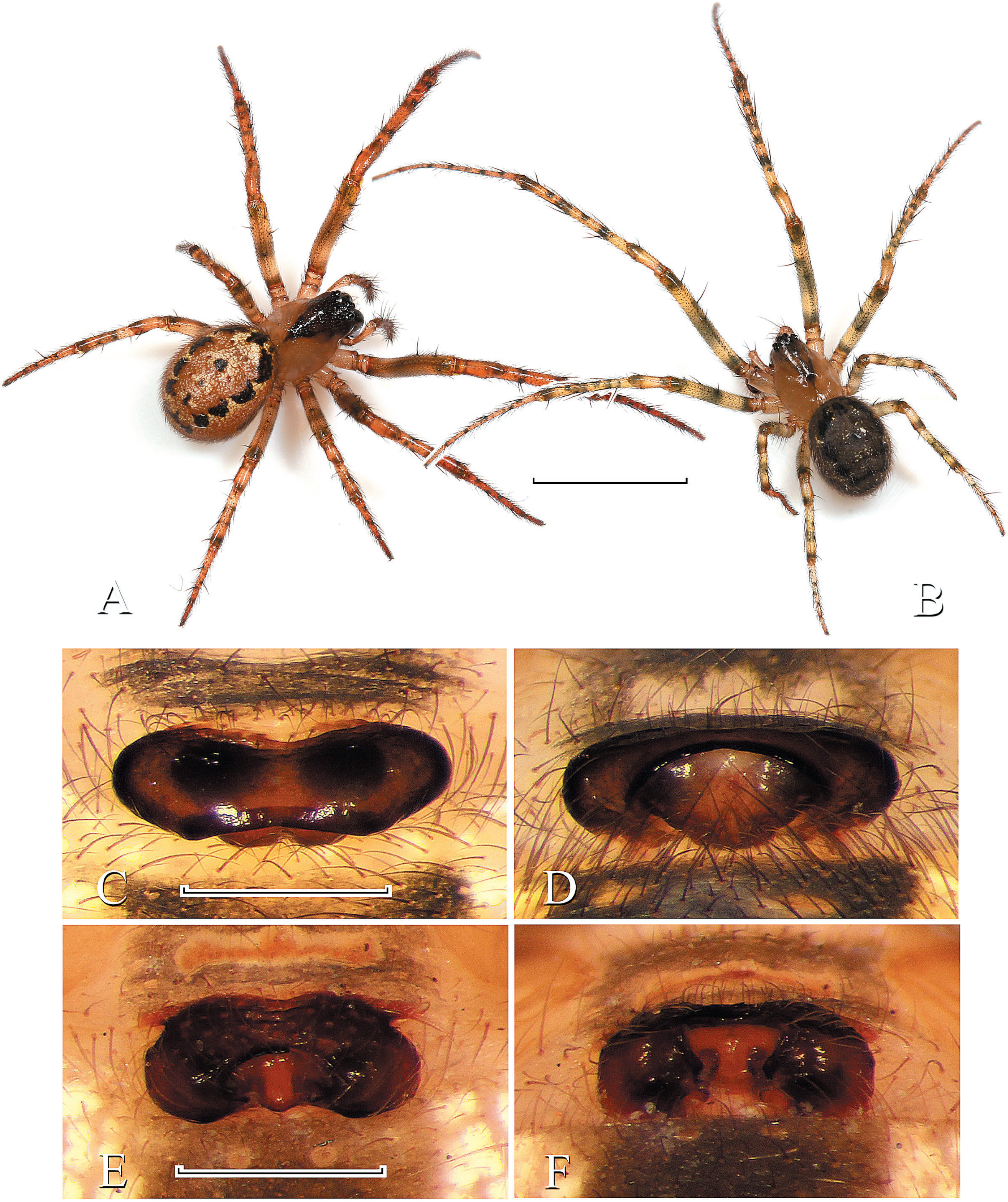

Fig. 1. *Zygiella hiramatsui* n. sp. (A–D) and *Zygiella dispar* (E–F: Hokkaido). A, habitus of female (paratype: NSMT-Ar 14742); B, habitus of male (holotype: NSMT-Ar 14738); C, E, epigyne, ventral view; D, F, same, posterior view.

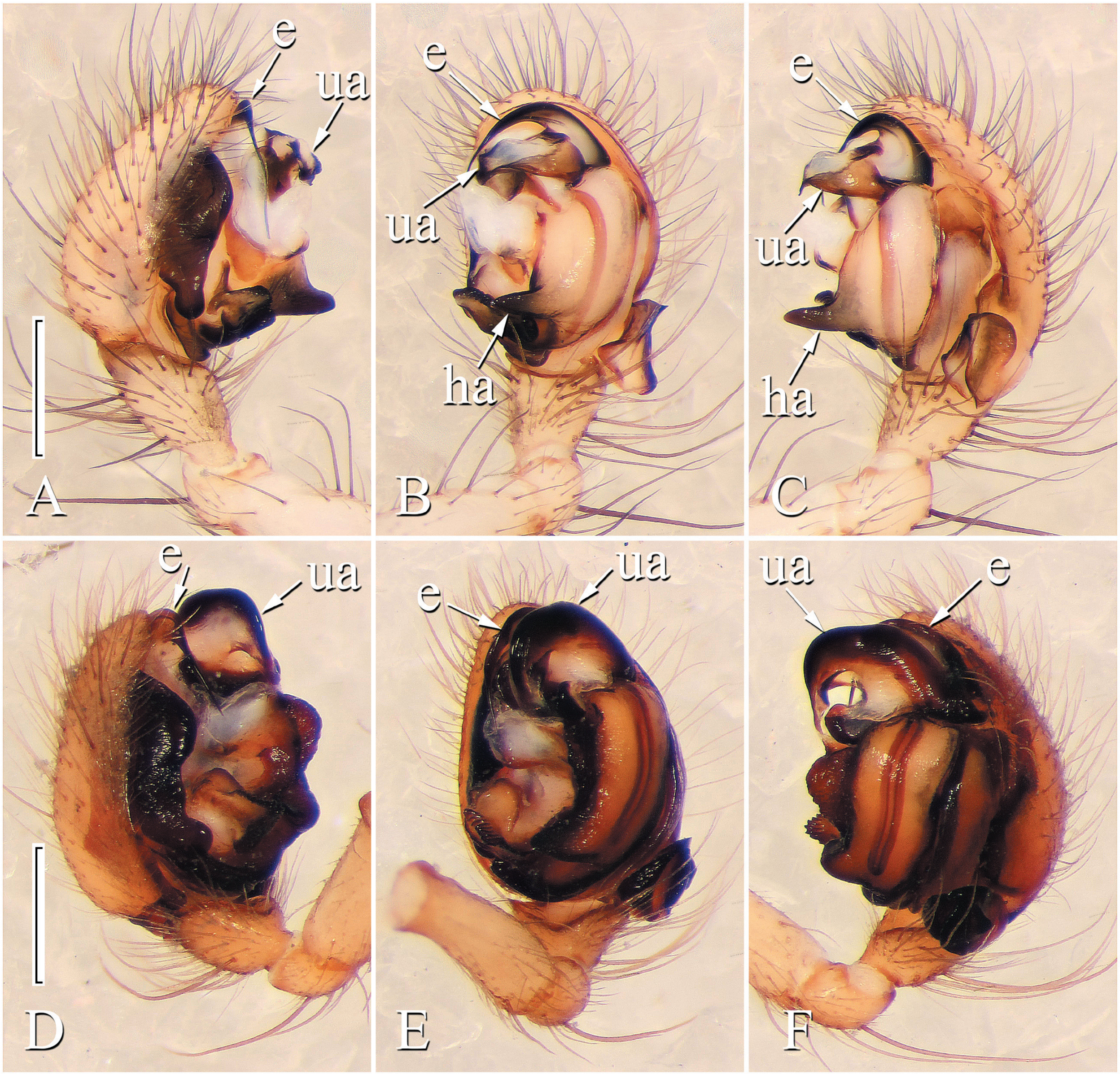

Fig. 2. Male palp of *Zygiella hiramatsui* n. sp. (A–C; holotype: NSMT-Ar 14738) and *Zygiella dispar* (D–F; Mt. Nipesotsu, Hokkaido). A, D, prolateral view; B, E, ventral view; C, F, retrolateral view. Abbreviations: e, embolus; ha, horn shaped apophysis of tegulum; ua, unnamed apophysis neighboring embolus. Scales = 0.5 mm.

2001, Lake Shikaribertsu; 1♀, 23-VI-1999, Mt. Higashi-Nupukaushinupuri, Shikaoi-cho.

Etymology. The name is dedicated to Takehisa Hiramatsu, who discovered the new species.

Diagnosis. Although it is uncommon for *Zygiella* spiders to inhabit subtropical regions, *Z. hiramatsui* should be placed in the genus *Zygiella* judging from characteristics of the epigyne and the male palp as well as general appearance.

Zygiella hiramatsui closely resembles *Z. dispar* in general appearance, but can be distinguished by the following points. 1) Female: median area of the epigyne is much wider than long (Figs. 1C–D vs. 1E–F), 2) male: unnamed apophysis neighboring the embolus is short and not tapered (Figs. 2A–C vs. D–F, ua; e: embolus), and a horn shaped apophysis of the tegulum (Figs. 2A–C vs. D–F, ha).

Description. Based on holotype ♂ (NSMT-Ar 14738) and paratype 1♀ (NSMT-Ar 14742). Coloration and markings. Male and female (Figs. 1A–B): carapace pale brown, head region darker. Dorsum of abdomen light brown, mottled with white, and with black folium.

Measurements. ♂/♀. Body 6.13/7.00 long. Carapace 2.96/3.40 long; 2.04/2.36 wide. Length of legs [tarsus + metatarsus + tibia + patella + femur = total]: I, 1.41 + 5.38 +

4.16＋1.63＋4.25＝16.83 / 1.00＋3.40＋2.96＋1.56＋3.40＝12.32; II, 1.09＋3.75＋2.88＋1.44＋3.31＝12.47 / 0.76＋2.56＋2.14＋1.36＋2.82＝9.64; III, 0.69＋1.31＋1.25＋0.88＋2.13＝6.26 / 0.64＋1.36＋1.12＋0.92＋2.04＝6.08; IV, 0.72＋2.00＋1.75＋1.06＋2.47＝8.00 / 0.60＋1.80＋1.62＋1.16＋2.48＝7.66. Abdomen 3.28/3.88 long; 2.48/3.88 wide.

Female and male. Carapace longer than wide [length divided by width 1.45/1.44]. Median ocular area almost as long as wide [length divided by width 0.97/1.12]; almost the same width in front as behind [anterior width divided by posterior width 1.19/1.02)]. Labium wider than long [length divided by width 0.63/0.74]. Sternum longer than wide [length divided by width 1.25/1.36]. Length of leg I divided by length of carapace 5.69/3.62. Male palp (Figs. 2A–C): unnamed apophysis neighboring embolus is short and truncated (Fig. 2, ua), tegulum with horn shaped apophysis (Fig. 2, ha). Abdomen longer than wide [length divided by width 1.32/1.21. Epigyne (Figs. 1C–D): median area much wider than long.

Distribution. Japan (Amami-ôshima Is.). As it is unusual for the *Zygiella* spider to inhabit subtropical regions, *Z. hiramatsui* might be introduced previously into Amami-ôshima Is. from unknown habitat.

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